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НАУЧНИ ИНСТИТУТ ЗА ПРЕХРАМБЕНЕ ТЕХНОЛОГИЈЕ

Teslić, N., Santos, F., Oliveira, F., Stupar, A., Pojić, M., Mandić, A., Pavlić, B., Cvetanović Kljakić, A., Duarte, A.R.C., Paiva, A., Mišan, A. (2022) Simultaneous hydrolysis of ellagitannins and extraction of el-lagic acid from defatted raspberry seeds using Natural Deep Eutectic Solvents (NADES). *Antioxidants*, 11, 254. DOI: 10.3390/antiox1102025

Antioxidants

Др Немања Теслић

Defatted raspberry seeds were used as an alternative source of antioxidants and ellagic acid (EA) extracted using Natural deep eutectic solvents (NADES). In the preliminary study, the best NADES combination (citric acid-betaine) and the most influential variables (temperature, time, and NADES/plant ratio) were selected for the further optimization process. All samples were analyzed in terms of total polyphenol, EA content, and antioxidant activity. Two sets of optimal conditions were generated by response surface methodology. The first set (Opt1) was designed for higher conversion of ellagitannins to EA while the latter set (Opt2) for higher EA content/100 g extract. Opt1 and Opt2 had higher values for all investigated responses compared to 80% ethanolic extract but had a lower conversion rate of ellagitannins to EA compared to acidified methanol extract. The third set of parameters (Opt3) selected beyond the initial experimental domain was used to obtain a sample with the highest EA content/100 g extract. Due to their nature, NADES extracts are ready to use and could have various technological roles in products since they are antioxidants, acidifiers, and colorants. NADES raspberry extracts exhibited higher anti-proliferative activity compared to ethanolic extracts in terms of EC50 values. However, the main contributor of anti-cancer activity in NADES raspberry extracts were individual NADES compounds and/or their newly formed NADES structure.

